

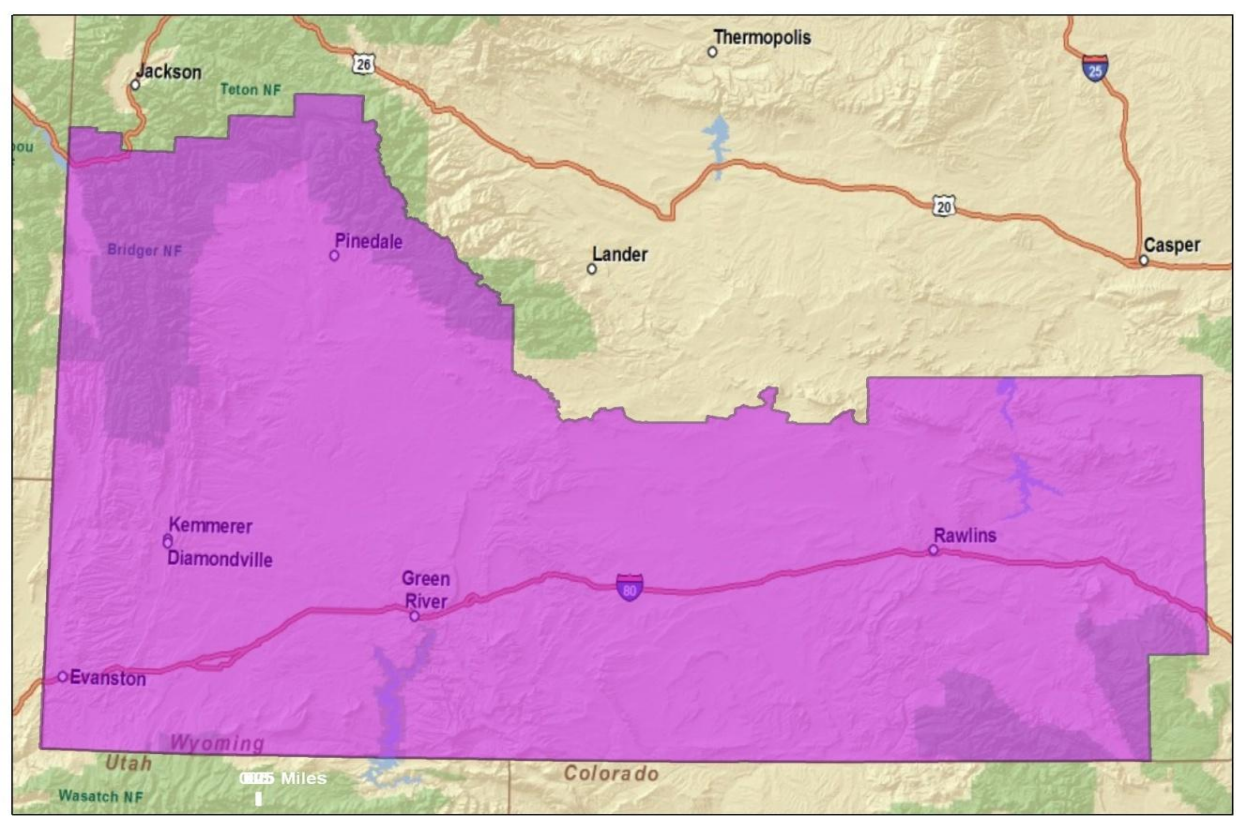
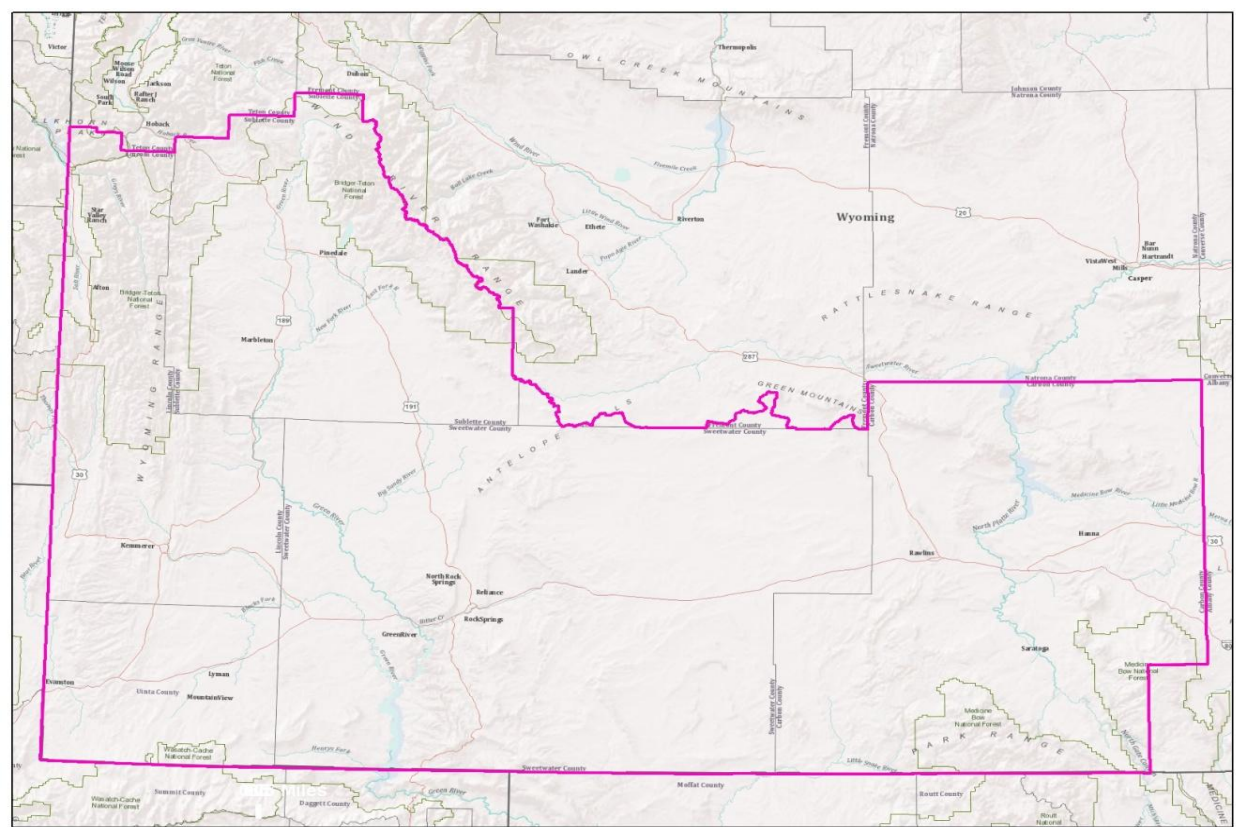
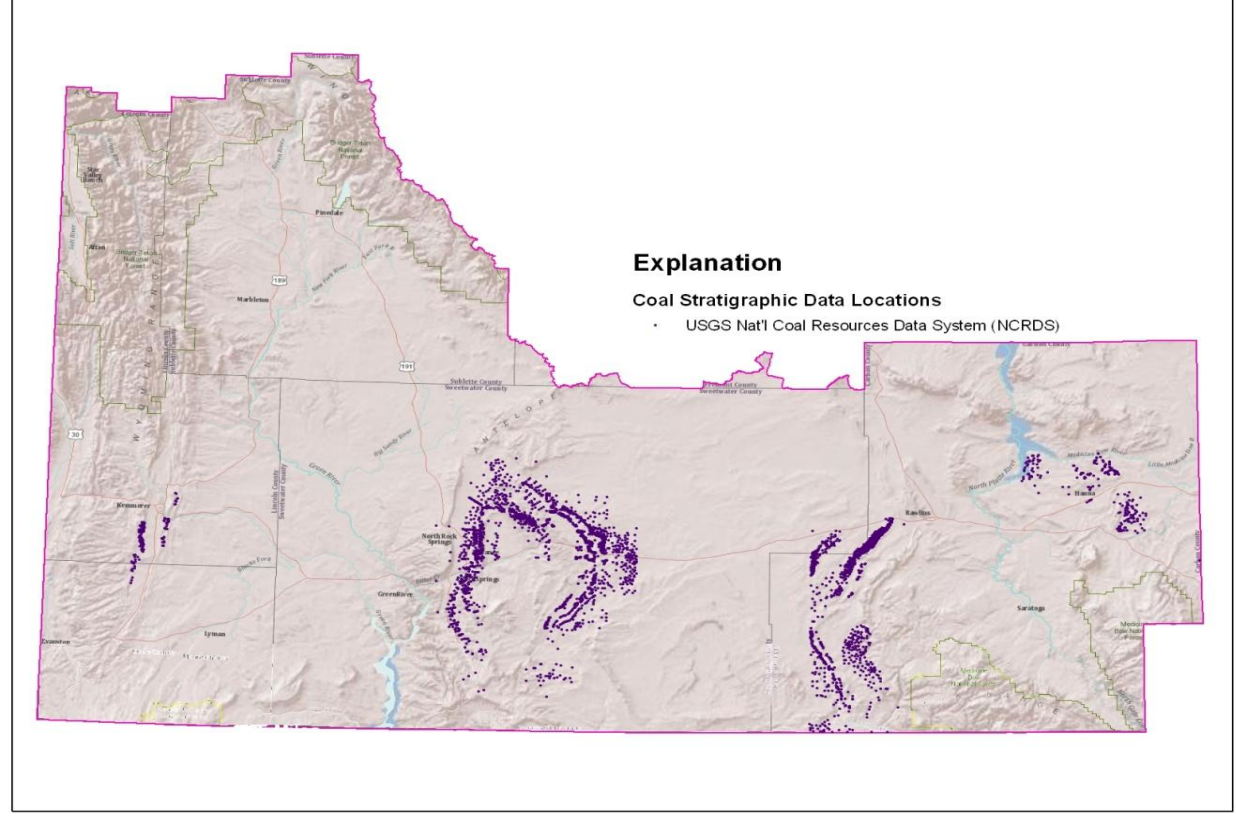
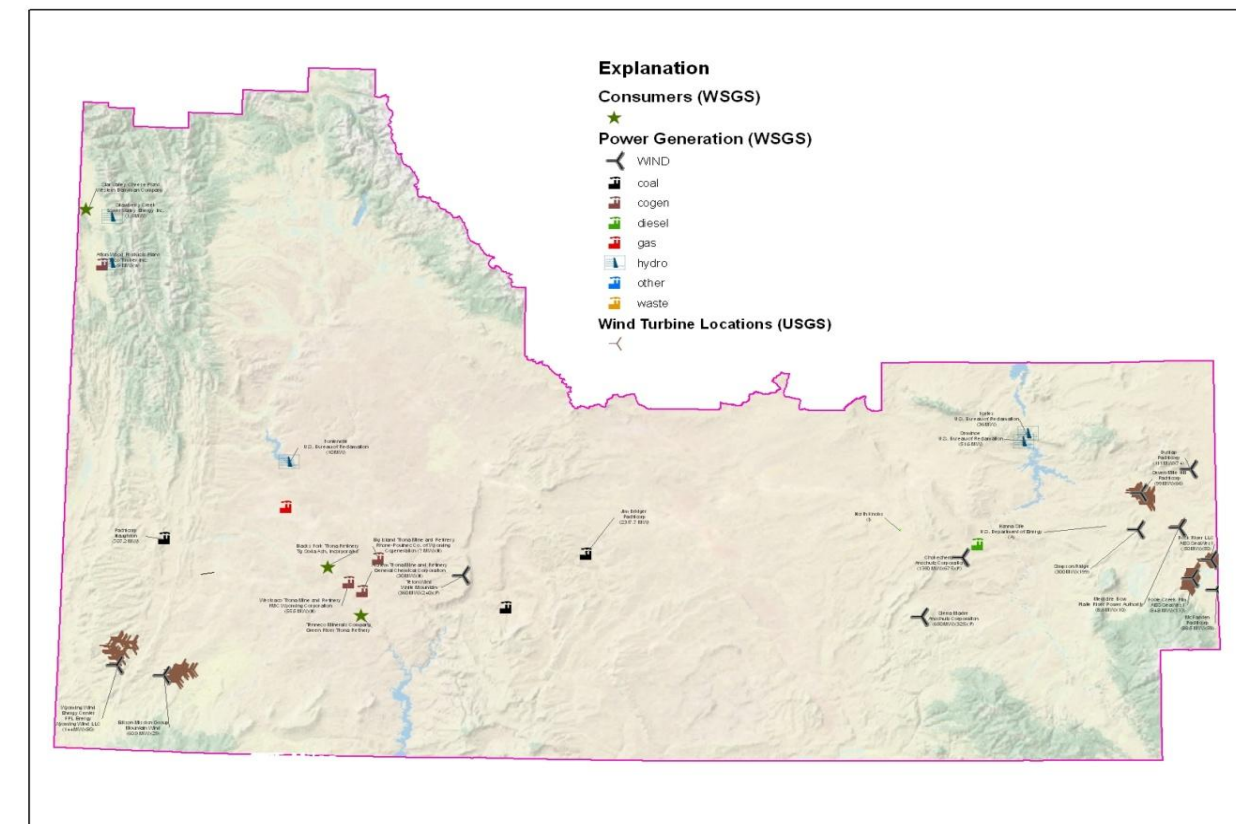
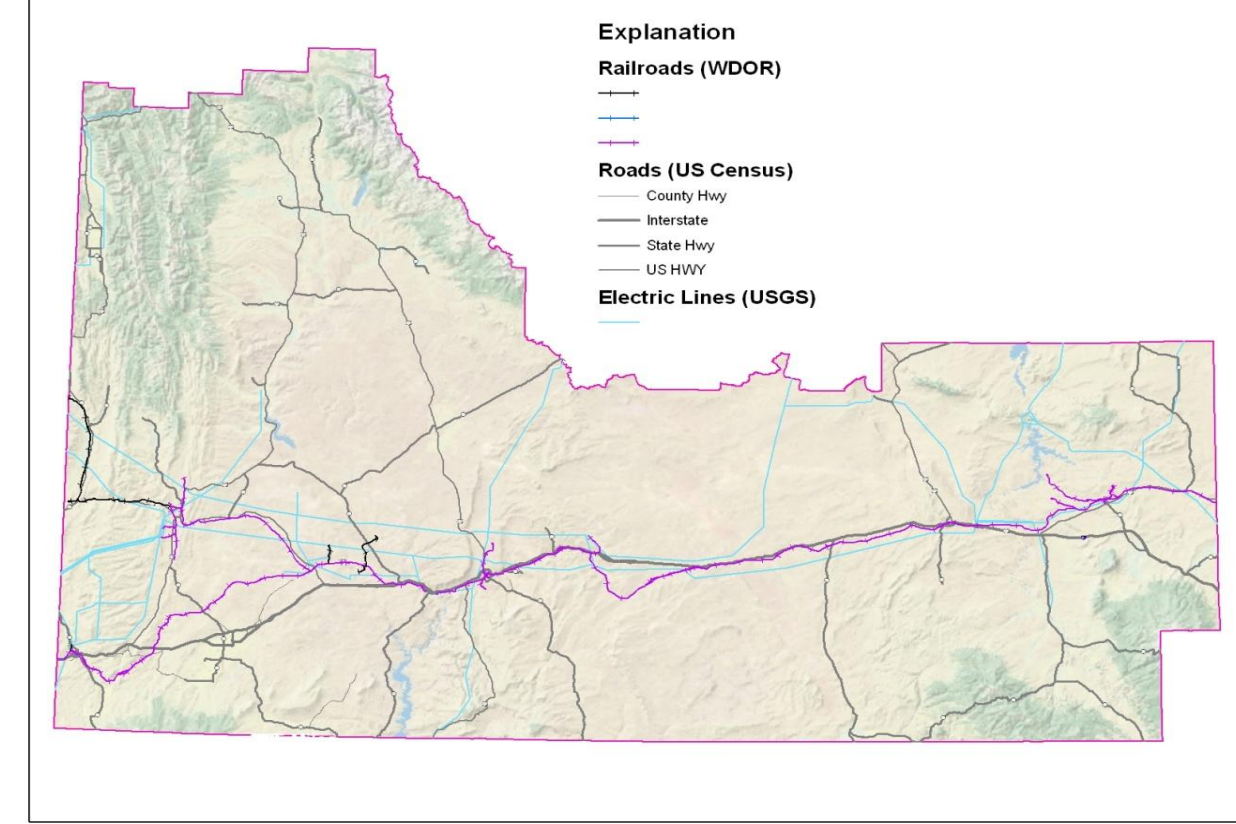
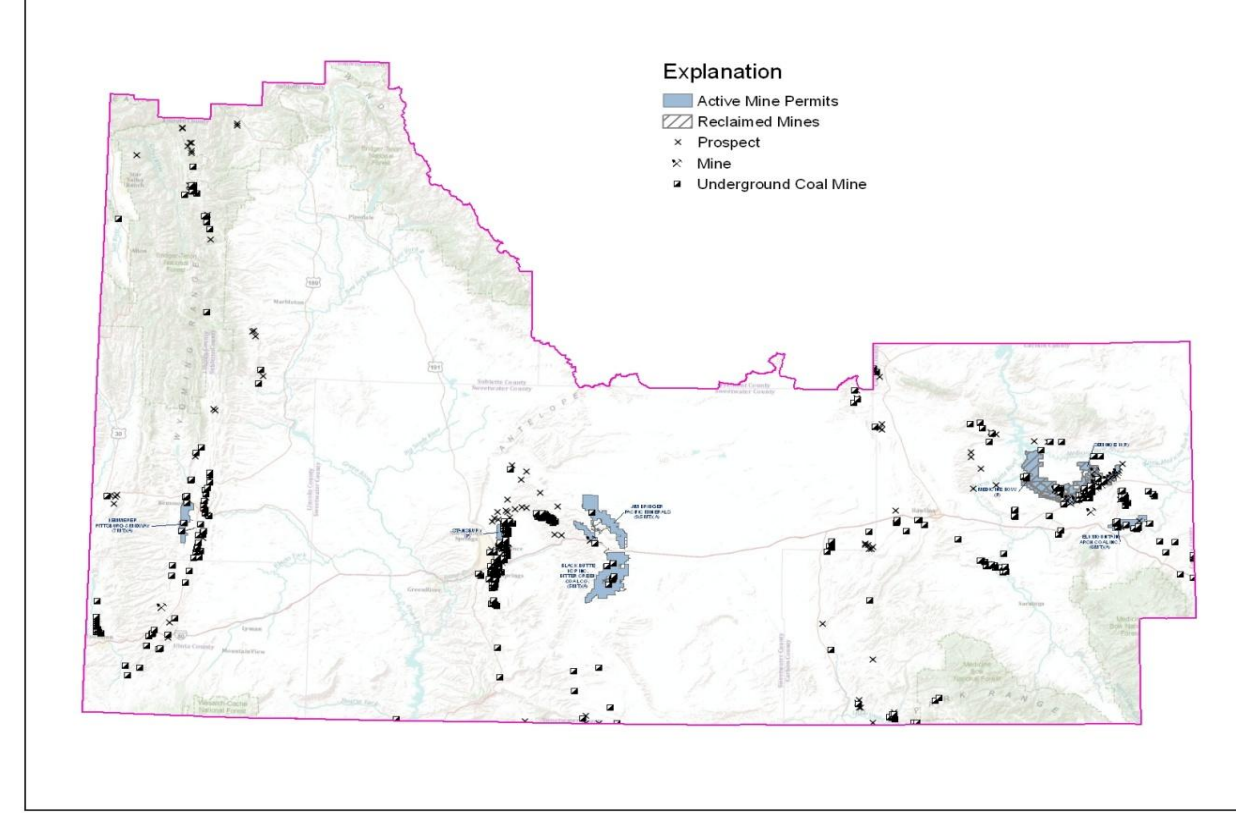
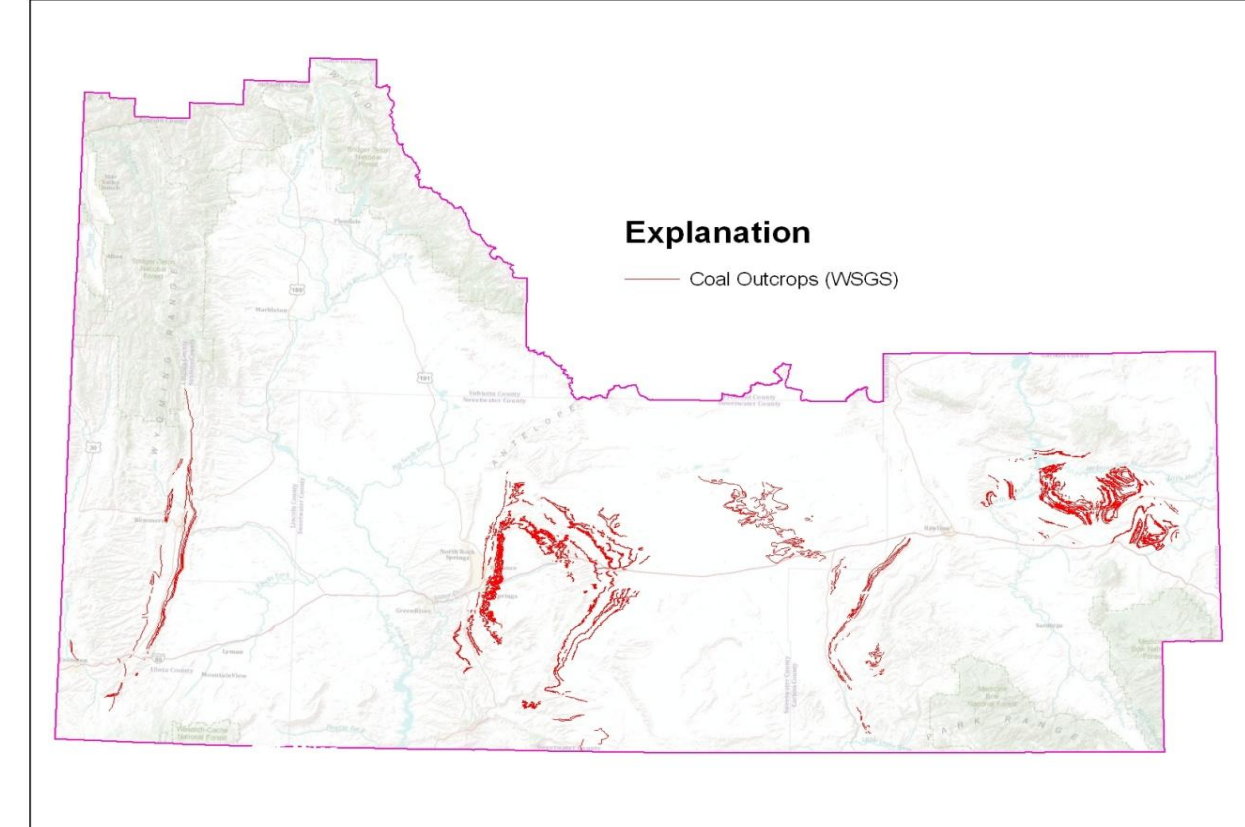
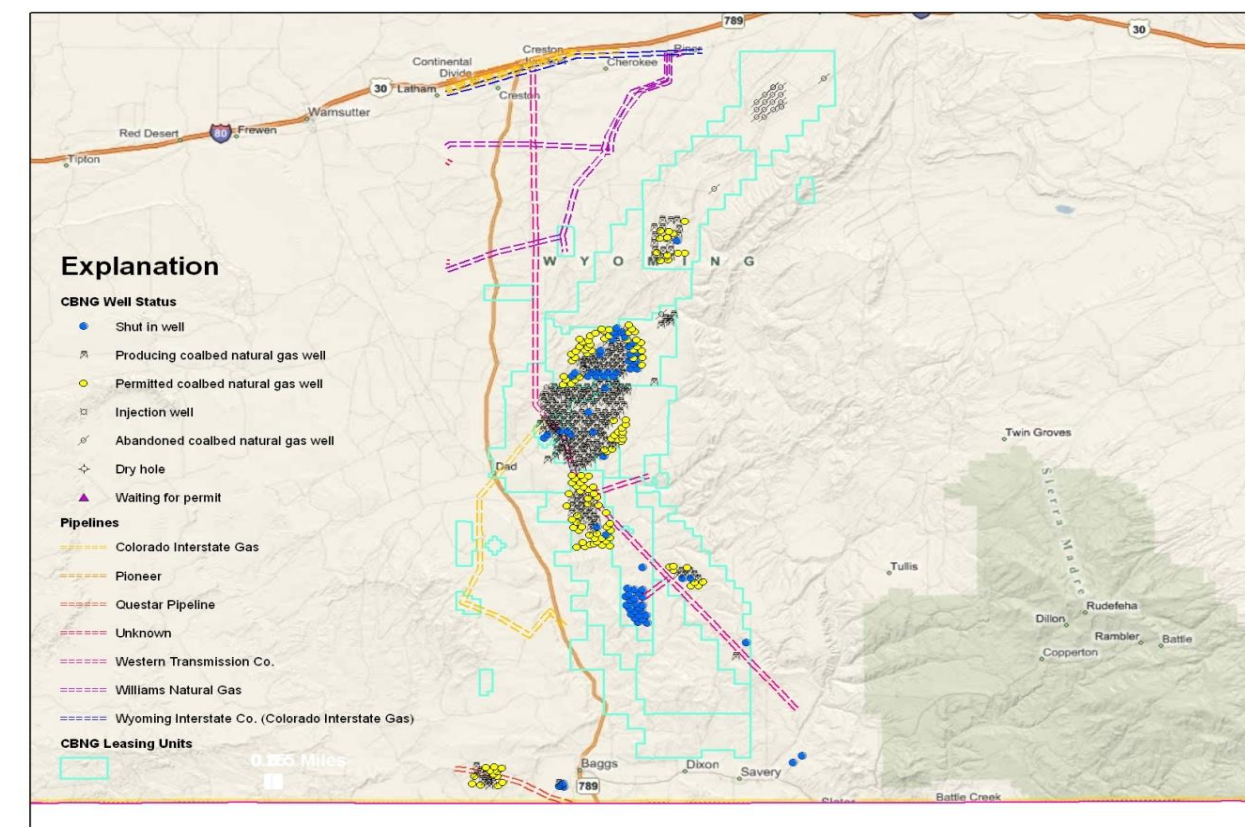
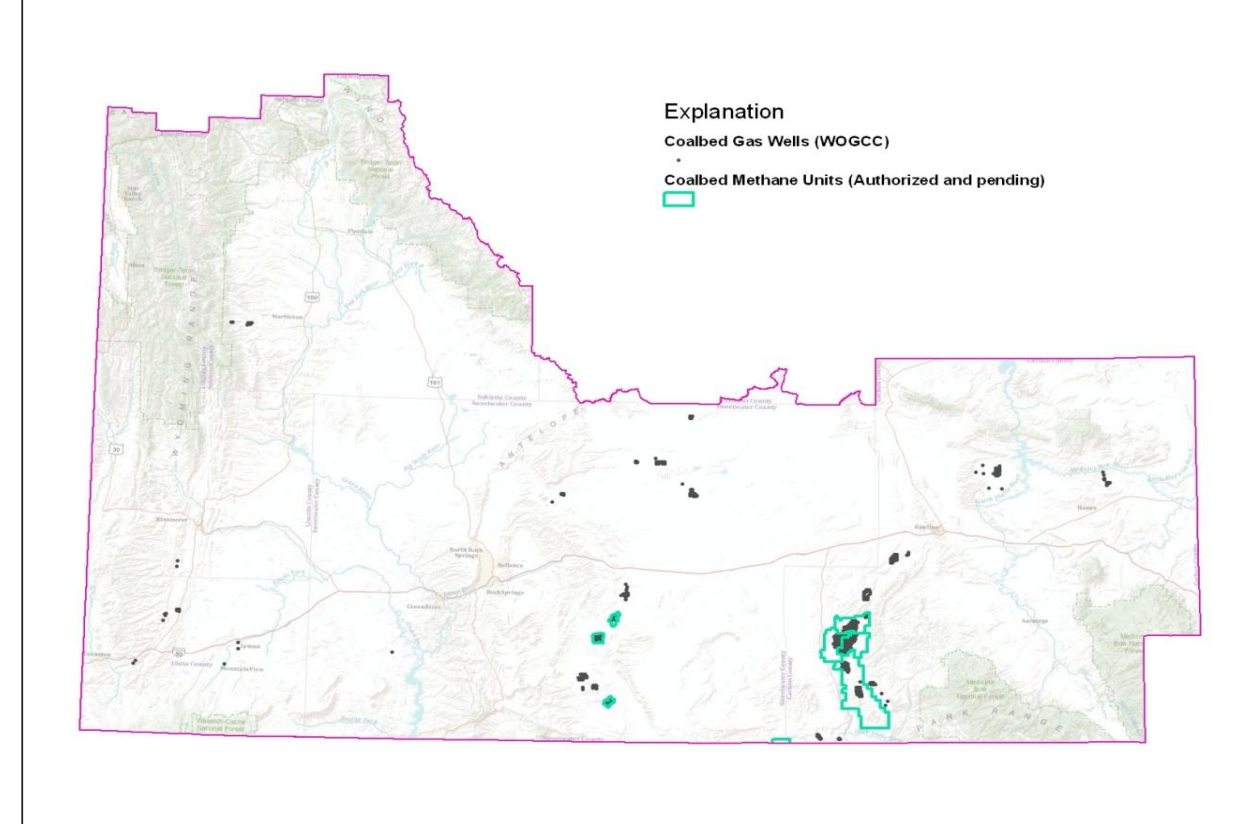
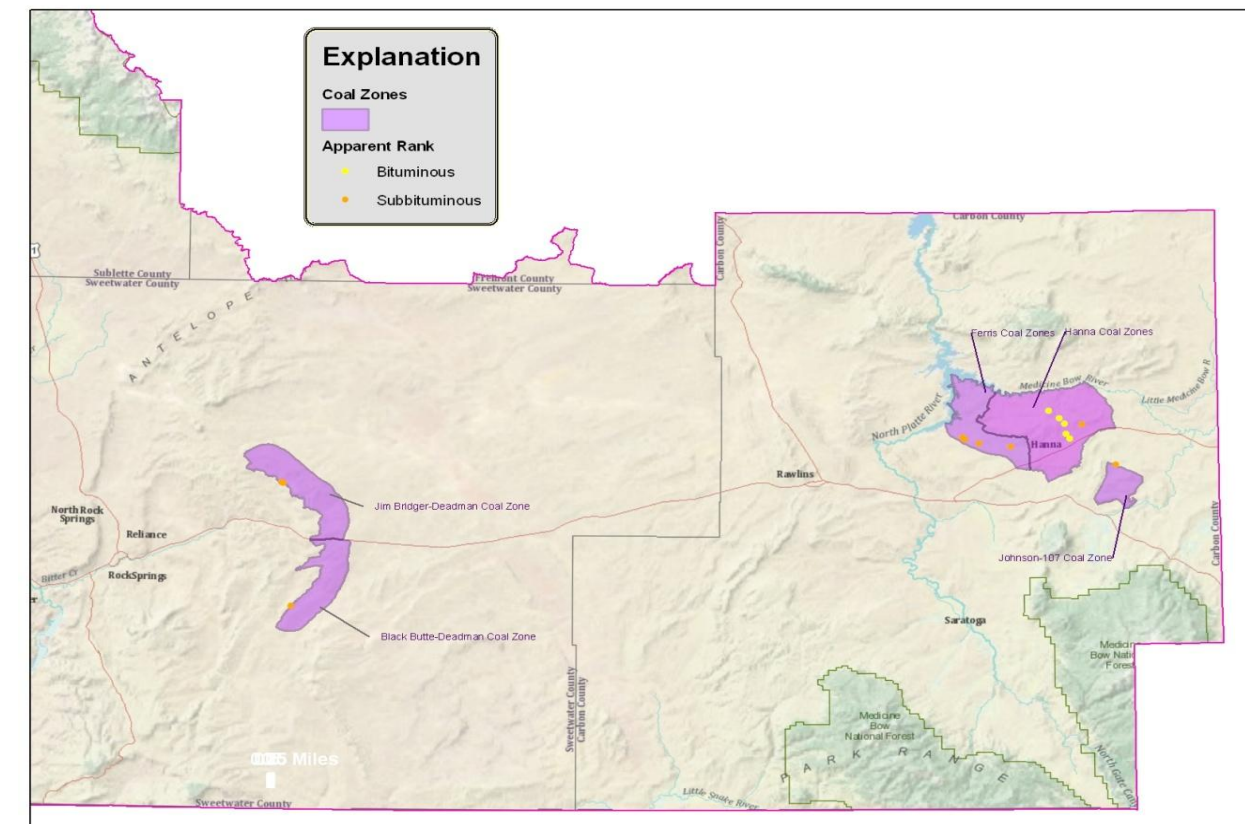
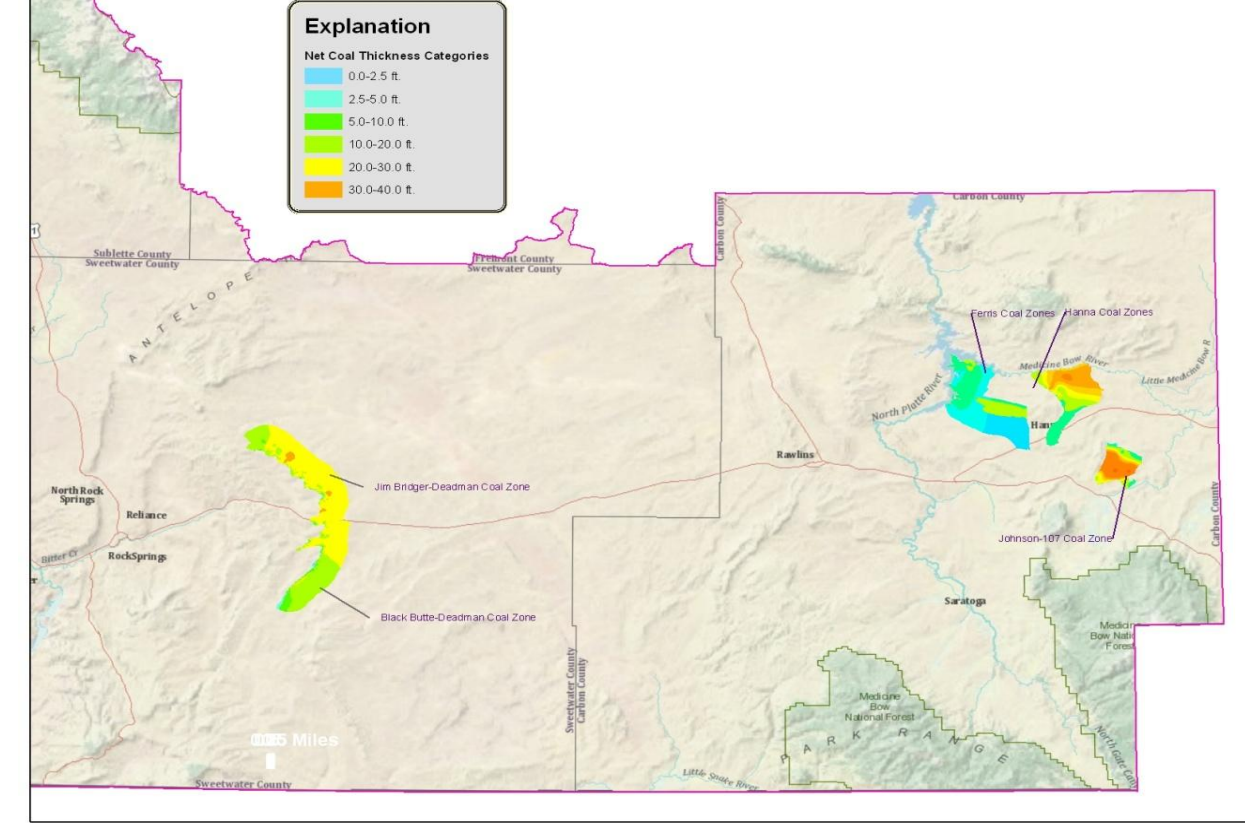
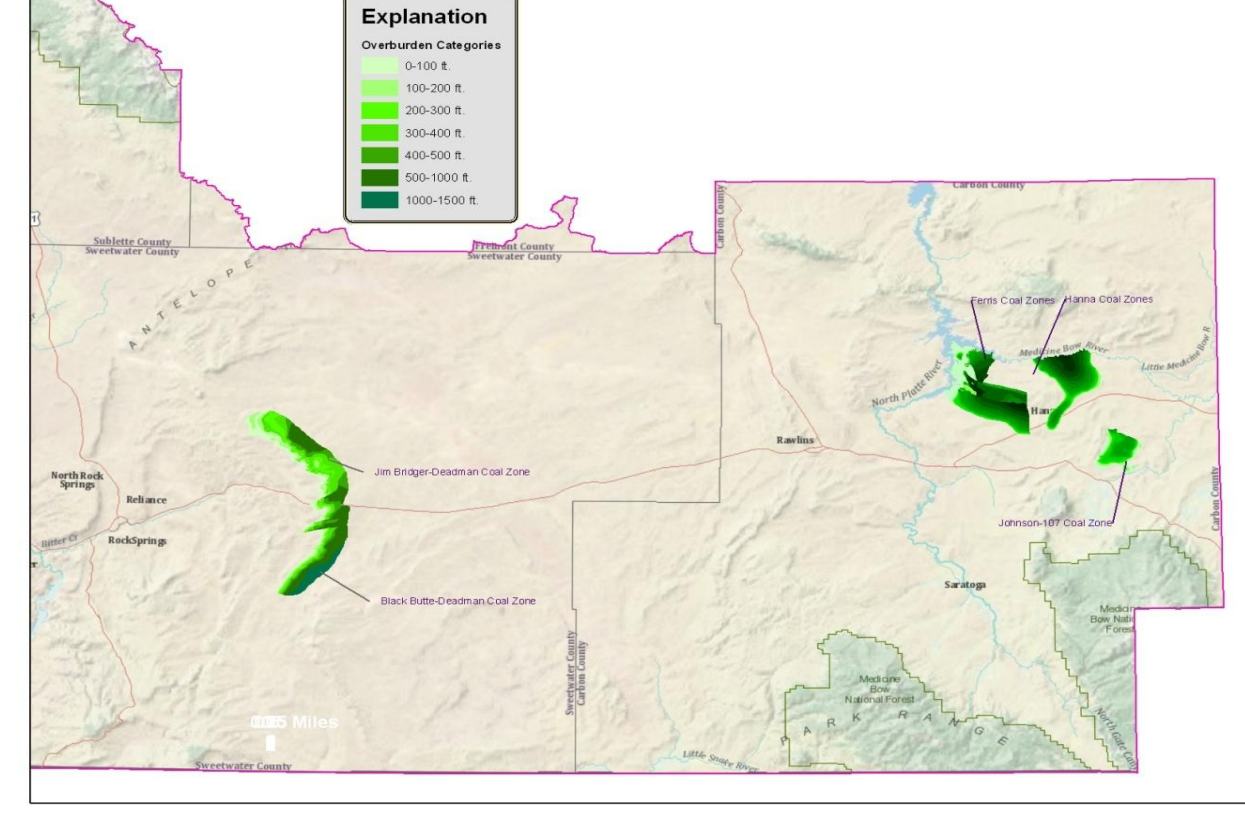
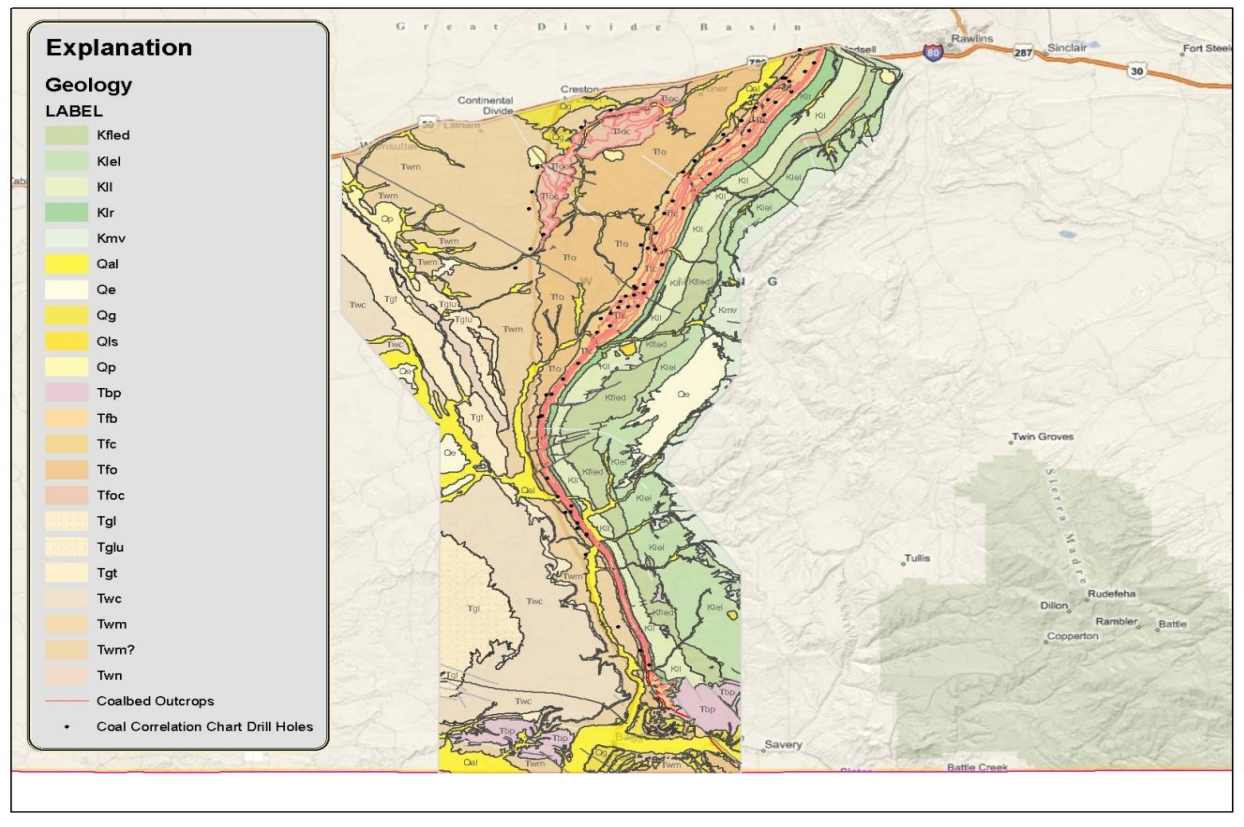
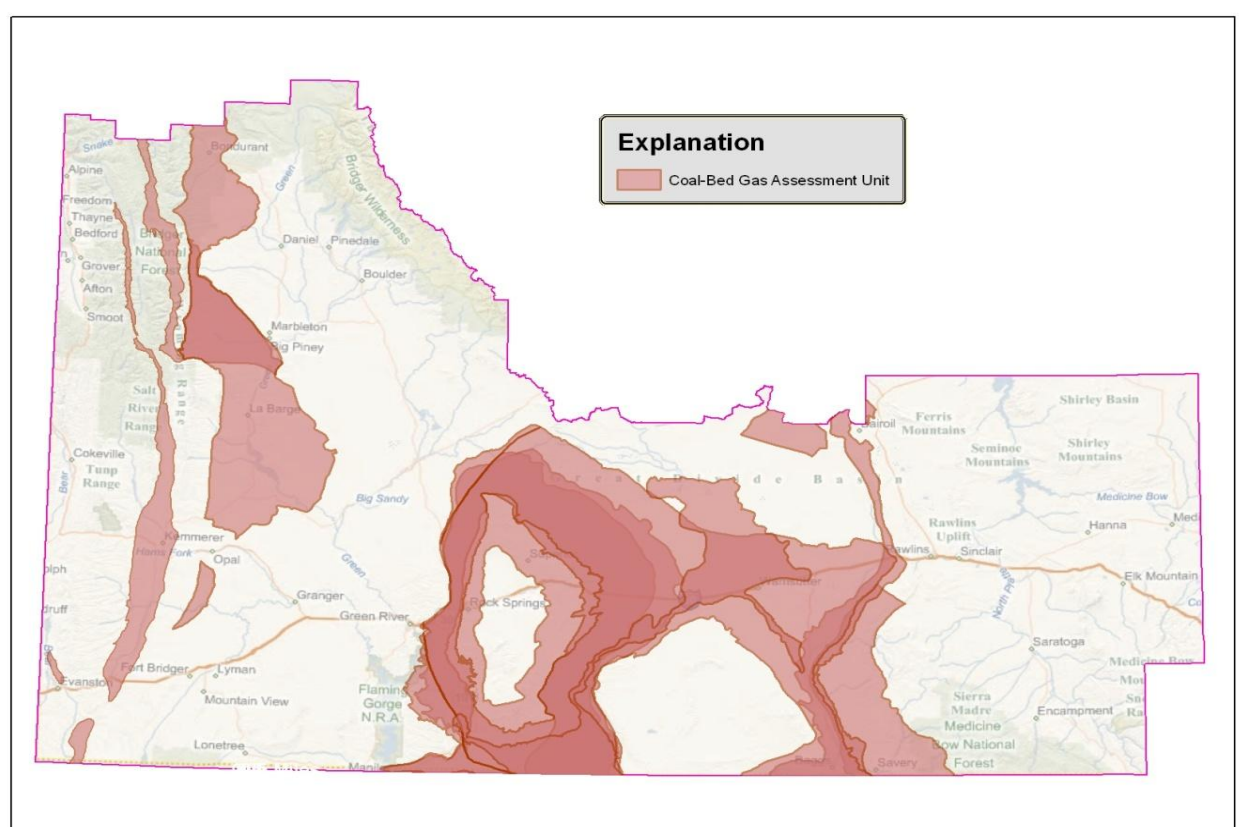
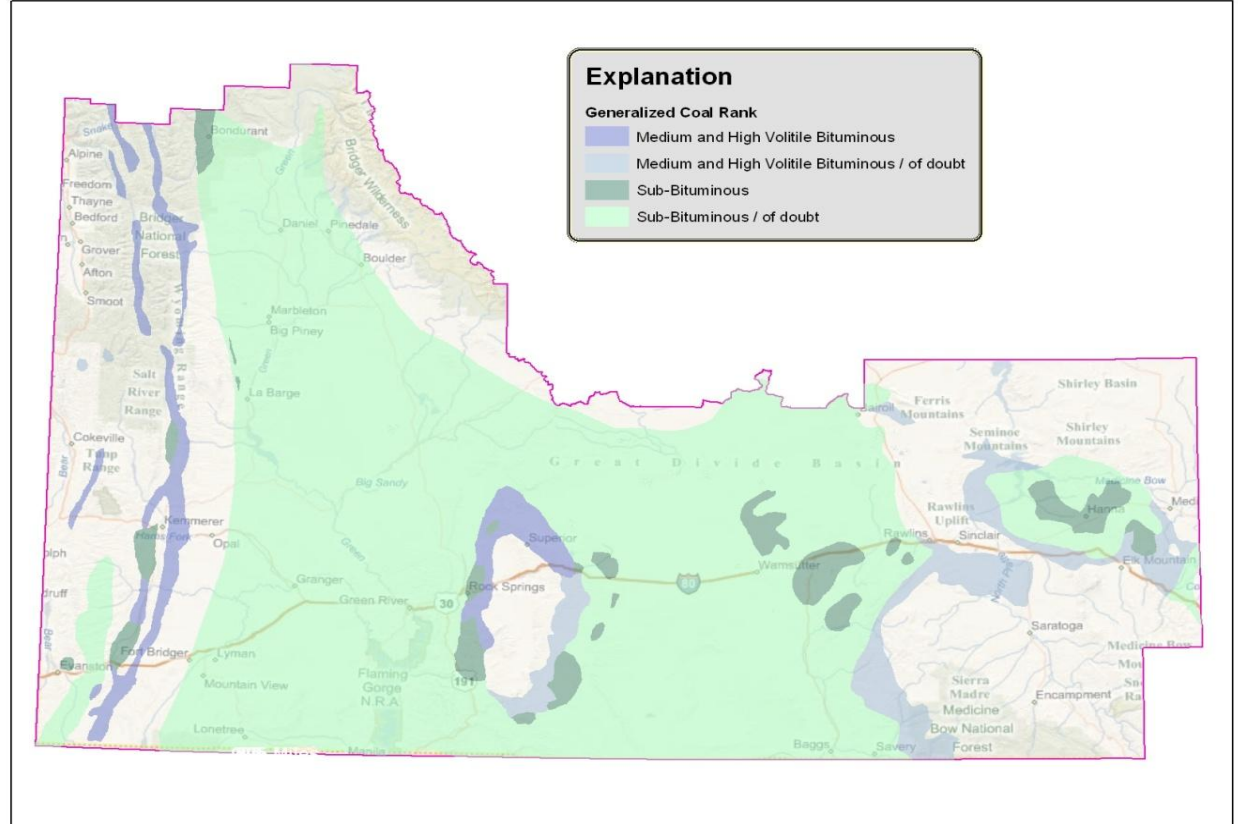
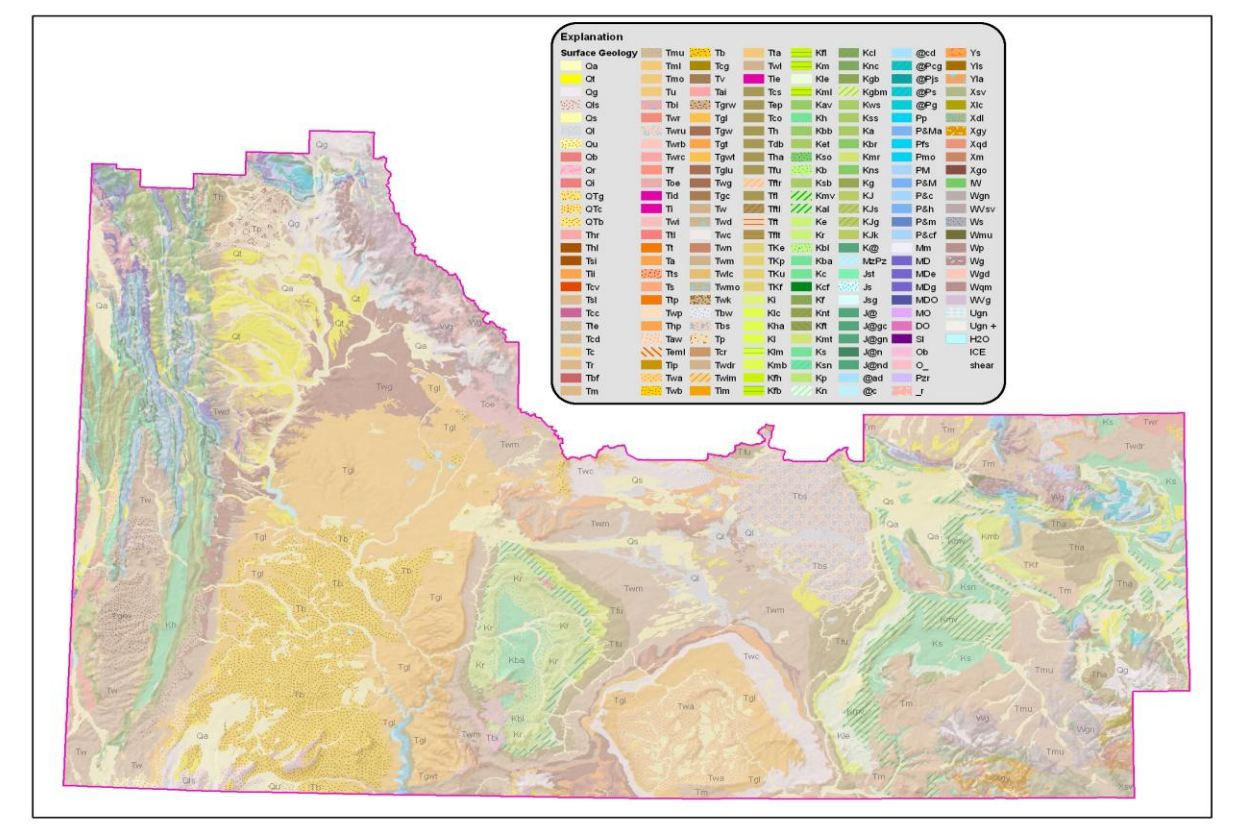
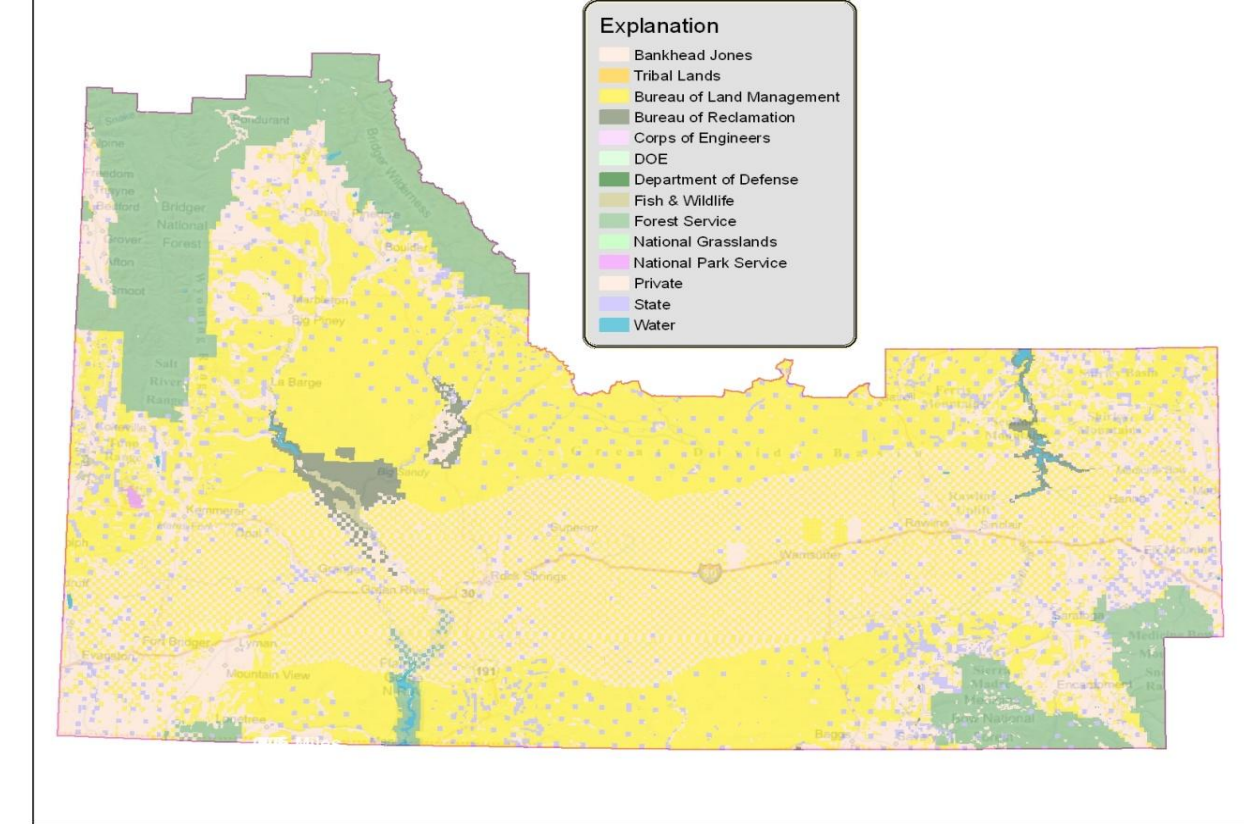
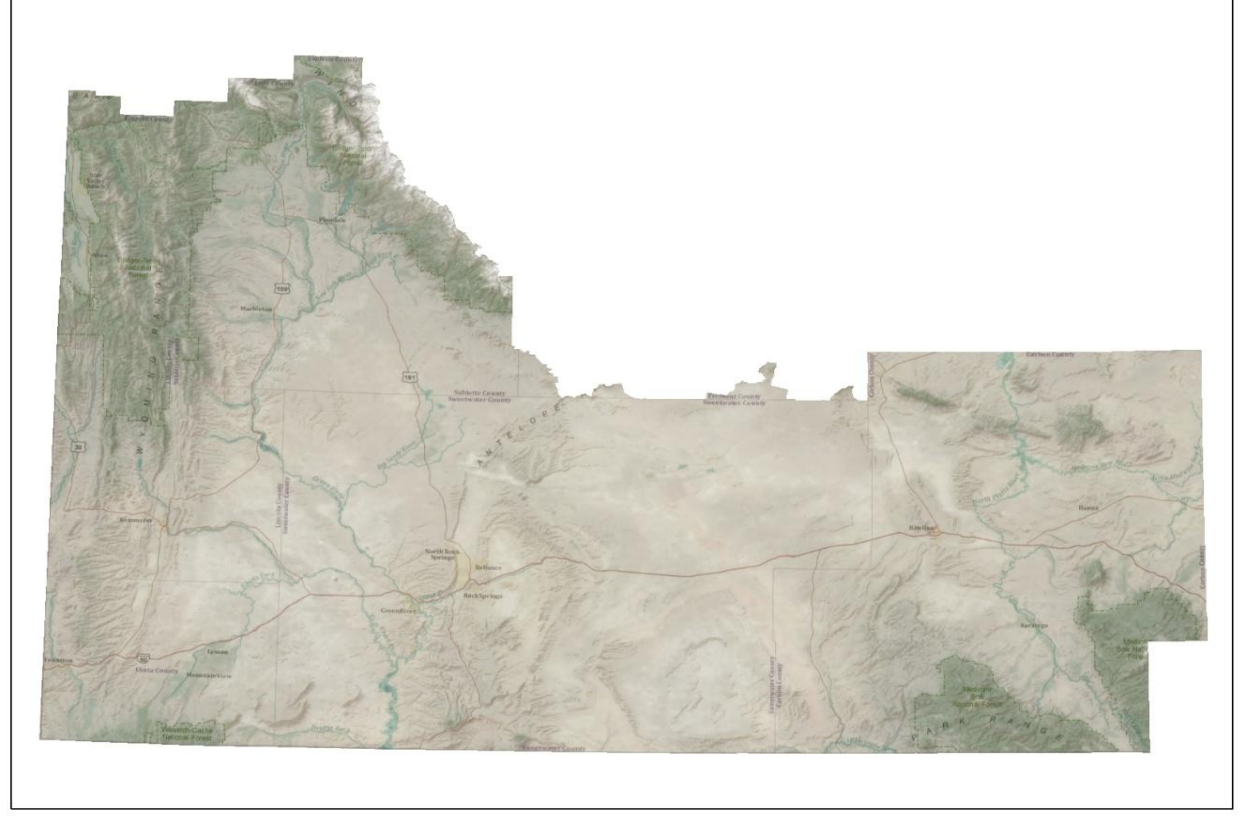
Thematic Layers	Source
Wyoming Landscape Conservation Initiative	
<p>These data represent the boundary of the Wyoming Landscape Conservation Initiative (WLCI). The WLCI is part of the Healthy Lands Initiative. The boundaries used for creating this dataset are as follows:</p> <p>South: Wyoming/Colorado/Wyoming/Utah State Line West: Wyoming/Utah/Wyoming/Idaho State Line North: Lincoln-Teton/Sublette-Teton/Fremont County line; following the Fremont County Line to the crossing of the Continental Divide and Fremont County. In Fremont County: all of the area south of the Divide. Where the Divide enters Sweetwater County, the boundary is the Fremont Sweetwater County line. Once the Divide meets the Carbon County line, then Carbon County forms the northern boundary. East: Carbon-Albany County line</p>	 <p>http://www.wlci.gov/</p>
Reference Boundaries and Transportation (ESRI ArcGIS Online Services)	
<p>These map services are designed to be used by GIS professionals to overlay basemaps and thematic maps such as demographics or land cover for reference purposes. These services include administrative boundaries, cities, water features, physiographic features, parks, landmarks, highways, roads, railways, and airports on a transparent background. The services were compiled from a variety of the best available data sources, including the U.S. Geological Survey (USGS), National Park Service, Tele Atlas, and ESRI. The services currently provide coverage for the world down to a scale of about 1:1m and coverage for the continental United States and Hawaii to a scale of about 1:70k (ESRI, 2009).</p> <p>If ArcMap is used, these services do not draw correctly unless 9.3.1 or a more recent version is used because it is cached using the PNG32 graphic format, which is not supported in ArcMap prior to 9.3.1. It can be used in ArcGlobe version 9.3 or more recent (ESRI, 2009).</p>	 <p>http://www.arcgis.com/home/</p>
Coal Stratigraphic Data (USGS National Coal Resources Data System)	
<p>The National Coal Resources Data System (NCRDS) is a national coal database containing stratigraphic records from cores and field observations. Data were collected by the U.S. Geological Survey and cooperating State geological survey agencies. This dataset represents the publicly available stratigraphic data as of 2002 and contains about 50 parameters describing the point location, data source, and coal information such as formation and bed name, thickness, top and bottom depths, and lithology. NCRDS data was developed to provide a large, comprehensive and publicly available digital coal database to be used in the estimation of coal resources in the United States.</p>	 <p>http://energy.er.usgs.gov/coal_quality/coal_data_bases.html</p>
Wind (USGS) and Infrastructure (WSGS)	
Power Generation and Consumers	
<p>A wind turbine GIS dataset (O'Donnell and Fancher, 2010) derived from aerial photographs available through the National Agriculture Imagery Program, provides information about each wind turbine's megawatt potential, size and manufacturing details, land ownership, power owners and users, and operational status.</p> <p>There are three datasets available for electric power generation sites. One was published by Jones and others (2009) as part of the Coal Map of Wyoming, and those data and annotations are shown on plate 1. The others were published in 2010 and include electric power-generating facilities over 1 megawatt (Stafford, 2010a) and wind farm projects (Stafford, 2010b). Some of the 2010 data are shown on plate 1, for those facilities not included in Jones and others (2009). All of the data published in the 2010 shapefiles are included in the Energy Map geodatabase. The 'Consumers' layer contains 3 industrial facilities that are coal users.</p>	 <p>http://www.fort.usgs.gov/Products/Publications/pub_abstract.asp?Pubid=22954,http://pubs.usgs.gov/ds/524/ andhttp://www.wsgs.uwyo.edu/GIS_and_online_map/digital_data.aspx</p>
Roads, Railroads and Electric Lines	
<p>These layers are published in the Wyoming State Geological Survey (WSGS), Coal Map of Wyoming, WSGS Map Series 93 (Jones and others, 2009). The origin of the roads data is the 1995 Bureau of Census TIGER/Line files; the railroad data are from the Wyoming Department of Revenue (1999) and the electric lines data were developed by the USGS, Snake River Field Station in 2004.</p>	 <p>http://www.wsgs.uwyo.edu/AboutWSGS/coal.aspx</p>
Coal Mines and Prospects (Underground, Mined-out and New Mines, as well as Mine Prospects)	
<p>The only active underground coal mine is the Jim Bridger longwall operation on the east flank of the Rock Springs uplift. The only active surface mine in Carbon County is the Elk Mountain/Saddleback Mine operated by Arch Coal; it will be converted to an underground mine if a coal-to-liquids plant is constructed near Medicine Bow. All other mines in the Hanna area are either abandoned underground workings or reclaimed surface mines (Jones, 2010; coal commun.). Surface coal mines are active on the east flank of the Rock Springs uplift and at the Kemmerer coal mine in Lincoln County. Another coal mines layer is included from the University of Wyoming Dept. of Geography (WYGISC, 2002). This layer shows mine locations and production in 1999, is included in the Energy Map geodatabase, but not visible on the PDF map.</p>	 <p>http://piney.wygisg.uwyo.edu/data/energy/coal_mine.zip</p>

Table 1. Layer Information, described by their order in the Published Map File.

Thematic Layers	Source
Coal Outcrops	
<p>This data set shows mapped and inferred coal outcrops clipped to the WLCI from a Wyoming state layer. This data set was compiled from Coal Resource and Occurrence Reports, Wyoming State Geological Survey publications, and other various reports and theses. Where available, this data set includes coal bed name, thickness, and basin name (Jones and others, 2009). Outcrops are also available in the Rawlins-Little Snake River Area for coal beds in the Fort Union Formation and the Nebraska coal bed in the Fox Hills Formation (see Rawlins-Little Snake River Area Geology and Coal Stratigraphy).</p>	 <p>http://www.wsgs.uwyo.edu/AboutWSGS/coal.aspx</p>
Coalbed Natural Gas	
Coalbed Natural Gas (Atlantic Rim)	
<p>These data show location and status of coalbed natural gas (CBNG) wells, authorized and pending CBNG leasing units, and oil and gas pipelines, clipped to the Atlantic Rim area, Carbon County, Wyoming. The data are from the Wyoming State Geological Survey, Atlantic Rim Area Coalbed Natural Gas Map, WSGS Open-File Report 09-7 (Quillinan and others, 2009). Generally, a limiting economic consideration for exploration and development of petroleum resources are the locations of pipelines, refineries, and gas processing plants (Quillinan and others, 2009).</p>	 <p>http://www.wsgs.uwyo.edu/news/jan25_2010.aspx</p>
Coalbed Methane Units (BLM) and Coalbed Gas Wells (WOGCC)	
<p>A unit agreement is an agreement approved by the authorized officer of the Bureau of Land Management (BLM) on behalf of the owners of oil and gas interests over a potential oil or gas reservoir who wish to unite to facilitate the orderly and timely development of the oil and gas resources within the unit area. This consolidation of separate leasehold interests eliminates the need to drill protective wells along common boundaries between unitized leases and serves to maximize benefits through a continuing exploration and development program (U.S. BLM, 2010d). The data for the wells are from the Wyoming Oil and Gas Conservation Commission (WOGCC) and include those classified as coalbed gas wells (WOGCC, 2010).</p>	 <p>http://www.blm.gov/wy/st/en/programs/energy/Oil_and_Gas/Leasing.html and http://wogcc.state.wy.us/</p>
Coal Assessment (USGS)	
Coal Quality and Assessed Coal Zones	
<p>The 1999 USGS coal assessment of the Northern Rocky Mountains and Great Plains region focused on selected coals in rocks of Tertiary age that will provide the bulk of the nation's coal-derived energy during the next few decades. Two of the areas are within the WLCI and include the Greater Green River Basin and the Hanna-Carbon Basin. Summaries of coal resources calculated by basin are 2.7 billion short tons in the Greater Green River Basin and 7.2 billion short tons in the Hanna-Carbon Basin. Many of the Tertiary coals in the Northern Rocky Mountains and Great Plains region contain low amounts of sulfur, ash, and trace elements of environmental concern. Because of the low level of these contaminants, most Tertiary coal is classified as compliant coal for use in electrical generation (USGS Fort Union Coal Assessment Team, 1999).</p>	 <p>http://pubs.usgs.gov/pp/p1625a/</p>
Net Coal Thickness Categories	
<p>For each assessed coal, net thickness categories were compiled and published in a geographic information system (GIS). In the Green River Basin, coal thickness categories represent the Deadman coal zone. In the Hanna Basin, several coal beds were assessed in the Ferris and Hanna Formations. In the Carbon Basin, the Johnson-107 coal zone was assessed (USGS Fort Union Coal Assessment Team, 1999).</p>	 <p>http://pubs.usgs.gov/pp/p1625a/</p>
Overburden Categories	
<p>For each assessed coal, overburden thickness categories were compiled and published in a geographic information system (GIS; USGS Fort Union Coal Assessment Team, 1999).</p>	 <p>http://pubs.usgs.gov/pp/p1625a/</p>

Thematic Layers	Source
Rawlins-Little Snake River Area Geology and Coal Stratigraphy	
<p>Because this region of south-central Wyoming has potential for coal development and was considered previously for coal leasing by the BLM, geologic data were mapped and published by the USGS for a 1,250 mi² region in the Rawlins-Little Snake River coal field in the eastern part of the Washakie and Great Divide Basins. Emphasis was placed on coal-bearing strata of the China Butte Member and the Overland Member (part) of the Paleocene Fort Union Formation. A structure contour and overburden map constructed on the uppermost coal bed in the China Butte Member is included (Hettinger and others, 2008).</p>	 <p>http://pubs.usgs.gov/sim/3053/</p>
Coalbed Gas Assessment Units (AUs)	
<p>The Mesaverde Coalbed Gas Assessment Units (AU) are defined as the areas where significant coal is present in the Almond Formation (Johnson and others, 2005) and in the Rock Springs Formation at depths of 6,000 ft or less. Commercial production rarely extends to depths greater than 6,000 ft (Finn and others, 2005). The Lance Coalbed Gas AU includes areas where coals in the basal 300–500 ft of the Lance Formation are interpreted to be at depths of 6,000 ft or less (Roberts, 2005). The Fort Union Coalbed Gas AU includes areas where coals in the Fort Union Formation are interpreted to be at depths of 6,000 ft or less (Roberts, 2005; Finn and others, 2005). The Wasatch-Green River Coalbed Gas AU includes areas where coals in the main body, and Red Desert and Noland Tongues of the Wasatch Formation, and the Luman Tongue of the Green River Formation are present in outcrops and in the shallow (depth less than 2,500 ft) subsurface (Roberts, 2005b). The Frontier-Adaville-Evanston Coalbed Gas AU is in the Wyoming Thrust Belt Province (Kirschbaum and others, 2004). The U.S. Geological Survey estimated a mean of 1.89 trillion cubic feet (TCF) of undiscovered coalbed natural gas in the Southwestern Wyoming (Kirschbaum and others, 2002) and Wyoming Thrust Belt (Kirschbaum and others, 2004) Provinces.</p>	 <p>http://pubs.usgs.gov/ds/ddo-069/ddo-069-d/,andhttp://pubs.usgs.gov/fs/2004/3025/fs-2004-3025.html</p>
Generalized Coal Rank	
<p>This data set was clipped to the WLCI from a polygon coverage representing the coal fields of the United States. Resolution of data is 1:5,000,000. Most of the material for the conterminous United States was collected from James Trumbull's Coal Fields of the United States (sheet 1, 1960) map (Tully, 1996).</p>	 <p>http://pubs.usgs.gov/of/1996/of96-092/</p>
Surface Geology	
<p>This geologic map was prepared as part of a study of digital methods and techniques as applied to complex geologic maps. The geologic map was digitized from the original scribble sheets used to prepare the published Geologic Map of Wyoming (Love and Christiansen, 1985), and consequently, is at 1:500,000 scale. Each vector and polygon was given attributes derived from the original 1985 geologic map. The data are intended to be used as a base geologic map, and are accessible online (Green and Drouillard, 1994).</p>	 <p>http://pubs.usgs.gov/of/1994/of-94-0425/</p>
Ownership	
<p>This dataset represents surface and mineral ownership for Wyoming, and is intended to represent the ownership information on Master Title Plates (MTPs). When the surface is Federal, surface ownership is identified by the Agency of jurisdiction. All other parcels are identified as either private or state. Mineral ownership identifies only the federal interest (U.S. BLM, 2009b).</p>	 <p>http://www.blm.gov/wy/st/en/resources/public_room/ga/datagis/themes/pls/gis.html</p>
Base Cartographic Maps (ESRI ArcGIS Online)	
<p>The ArcGIS.com website permits access to all the content in ArcGIS Online using a Web browser (ESRI, 2010). ArcGIS Online is ESRI's shared repository of maps, data, applications, and tools, the content of which are from ESRI, its partners, and the GIS community at large. Anyone can share maps and data via ArcGIS Online. Several ArcGIS Online services are embedded in the interactive map, including the Natural Earth physical map (Source: US National Park Service), high-resolution imagery (Copyright: © 2009 ESRI, i-cubed, GeoEye), street-level data (Copyright: © 2009 ESRI, AND, TANA, ESRI Japan, UNEP-WCMC), topographic information (Sources: USGS, FAO, NPS, EPA, ESRI, Delorme, TANA, other suppliers), and shaded relief (Copyright: © 2009 ESRI).</p>	 <p>http://www.arcgis.com/home/gallery.html</p>